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ABSTRACT

This manual is designed to help Army training personnel select and implement a specific approach to achieving specific training goals. Following a general learning model, general training principles are summarized. The rest of the manual shows how specific learning principles are associated with groups of learner performances. Training goals include recall of facts and procedures, acquisition of motor skills and reactive skills, concept acquisitions, problem solving, decision making, and putting attitudes into practice. (CH)

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Selecting Methods and Media to Achieve Training Objectives: A Preliminary Manual

by

Ronald W. Spangenberg

February 1971

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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CONTENTS

Chapter		Page
1	TRAINING MATERIALS DEVELOPMENT	1
2	GENERAL LEARNER MODEL	6
	Output	6
	Throughput	6
	Input	6
3	INFORMATION AVAILABILITY: TYPE OF INFORMATION	12
	Types of Information	12
	Principles	14
	Type of Information and Instructional Devices	15
4	INFORMATION AVAILABILITY: EXPOSURE	19
	Principles	19
	Attention	19
	Selective Perception	20
	Exposure to Material	21
	Learner Involvement	21
	Research Studies	22
	Instructional Device Characteristics	24
5	INFORMATION AVAILABILITY: DISPLAY DESIGN	26
	Principles	26
	Research Studies	27
	Instructional Device Characteristics	29
6	RECALL OF FACTS	32
	Principles Applicable to Recall of Facts	32
	An Approach to Recall of Facts	33
	Facilitating the Approach	34
7	RECALL OF PROCEDURES	36
	Principles Applicable to Recall of Procedures	36
	An Approach to Recall of Procedures	36
	Facilitating the Approach	38
8	ACQUISITION OF DISCRETE MOTOR SKILLS	40
	Principles Applicable to Discrete Motor Skills	40
	An Approach to Acquiring Discrete Motor Skills	41
	Facilitating the Approach	42
9	ACQUISITION OF REACTIVE SKILLS	44
	Principles Applicable to Reactive Skills	44
	Approach to Acquiring Reactive Skills	45
	Facilitating the Approach	46

Chapter

10 USE OF CONCEPTS: CONCEPT ACQUISITION
Principles Applicable to Concept Using
Primary Conditions for Concept Using
Approach to Concept Acquisition
Facilitating the Approach to Concept Acquisition
11 USE OF CONCEPTS: PROBLEM SOLVING
Approach to Problem Solving
Facilitating the Approach to Problem Solving
12 REACTIVE DECISION MAKING
Principles Related to Reactive Decision Making
Approach to Reactive Decision Making
Facilitating Reactive Decision Making
13 PUTTING ATTITUDES INTO PRACTICE
Principles Related to Attitude Change
Approach for Putting Attitudes into Practice
Helping Put Attitudes into Practice

Figures

1 Twelve-Step Procedure for Developing Training Materials
2 General Learner Model
3 Types of Information in Relation to Sensory Channels

Tables

1 Information Type and Instructional Devices
2 Information Exposure and Instructional Devices
3 Display Characteristics and Instructional Devices
4 Instructional Device Capability and Recall of Facts
5 Instructional Device Capability and Recall of Procedures
6 Instructional Device Capability and Acquisition of Discrete Motor Skills
7 Instructional Device Capability and Acquisition of Reactive Skills
8 Instructional Device Capability and Acquisition of Concepts
9 Instructional Device Capability and Problem Solving
10 Instructional Device Capability and Interactive Decision Making
11 Instructional Device Capability and Putting Attitudes into Practice

Glossary

INTRODUCTION

Purpose and Scope

This manual is designed to help personnel engaged in the development and management of Army training to select and implement a specific approach to achieving a desired training goal. For each approach, the instructional devices that can lead to the most effective achievement of the desired human performance are listed. Increased effectiveness of training programs should result from using the suggested guidelines.

This manual is not a handbook on the development of military training courses, nor is it a handbook on the technical characteristics of instructional devices. This manual is prepared on the assumption that the user already has background in these matters, and has access to official Army guidance documents[1] and media references[2]. The objective of this manual is to support alternative approaches toward achieving training goals which will effectively provide the same level of human performance.

Within the overall process of designing training systems as specified in [illegible] Regulations 350-100-1 and Chapter 11, this manual describes a systematic procedure for use during the process of developing training materials. A general human model (Chapter 2) is used as a device by which the conclusions derived from analyzing the appropriate research literature are organized and presented. This model makes explicit the assumptions used in selecting materials for the manual. General principles, many pertaining to human perception, are summarized in three chapters concerning information availability and general learning. These materials are based on the general assumption that human performance is controlled by varying the information available to the learner. In the remainder of the manual, specific training principles are associated systematically with groups of human performances to derive specific approaches to a training program goal, and the instructional devices which would facilitate these training approaches are listed.

[1] See particularly, [illegible] Regulations 350-100-1, Training Systems Engineering of Training Courses (Design), and [illegible], Field Manual 21-5, Training of Military Instructors.

[2] See especially: James W. Brown, Richard B. Lewis, and Fred F. Harcleroad, AV Instructional Media and Methods, 4th ed.; McGraw-Hill Book Company, New York, 1969; Edgar Dale, Audio-Visual Methods in Teaching, rev. ed.; Dryden, Holt and Rinehart, New York.

Program of Instruction (POI) and training schedule. Preconditions to these activities include training analysis, study of student characteristics, and determination of available resources. Not stated as part of the process, but considered essential in modern training technology, is the pretesting of training materials, and them making appropriate revisions; this recommended pretesting is distinguished from normal student testing and quality control testing.

Figure 1 is a flow chart that illustrates the sequencing and the interactions of the procedures that are involved in the overall development and construction of training materials (this manual helps the manager perform steps 5 and 6). The activities may be summarized as follows:

Insert Figure 1

(1) Perform or obtain a training analysis (as outlined in Appendix C, CONRC Regulation 350-100-1) on the basis of the job analysis.

(2) Analyze the learner(s). Specify the initial skills and abilities, and the final performances desired. Become familiar with the previous knowledges and understanding levels of the learner.

(3) See what resources are available. Check manpower, equipment, training priority, and other related factors.

(4) Look at the learner performances specified by the training analysis and see whether these performances are actually necessary on the job. Determine why apparently unrelated performances have been included; eliminate unnecessary performances. Do the training analyses clearly identify the learner subskills that will be needed for adequate final performance? Is the analysis broken down to a simple enough level for the immediate learning of tasks? Identify the learning experiences (teaching points) needed for the learner to accomplish the desired final performance. Relate the selected learning experiences to the appropriate military reference or manual. Program the learning experiences so that the learner acquires the appropriate prerequisite subskills before proceeding to the next level.

(5) Select training approaches. The learner performances that are desired will suggest approaches that will be effective in achieving training goals. A motor skill

Twelve-Step Procedure for Developing Training Materials

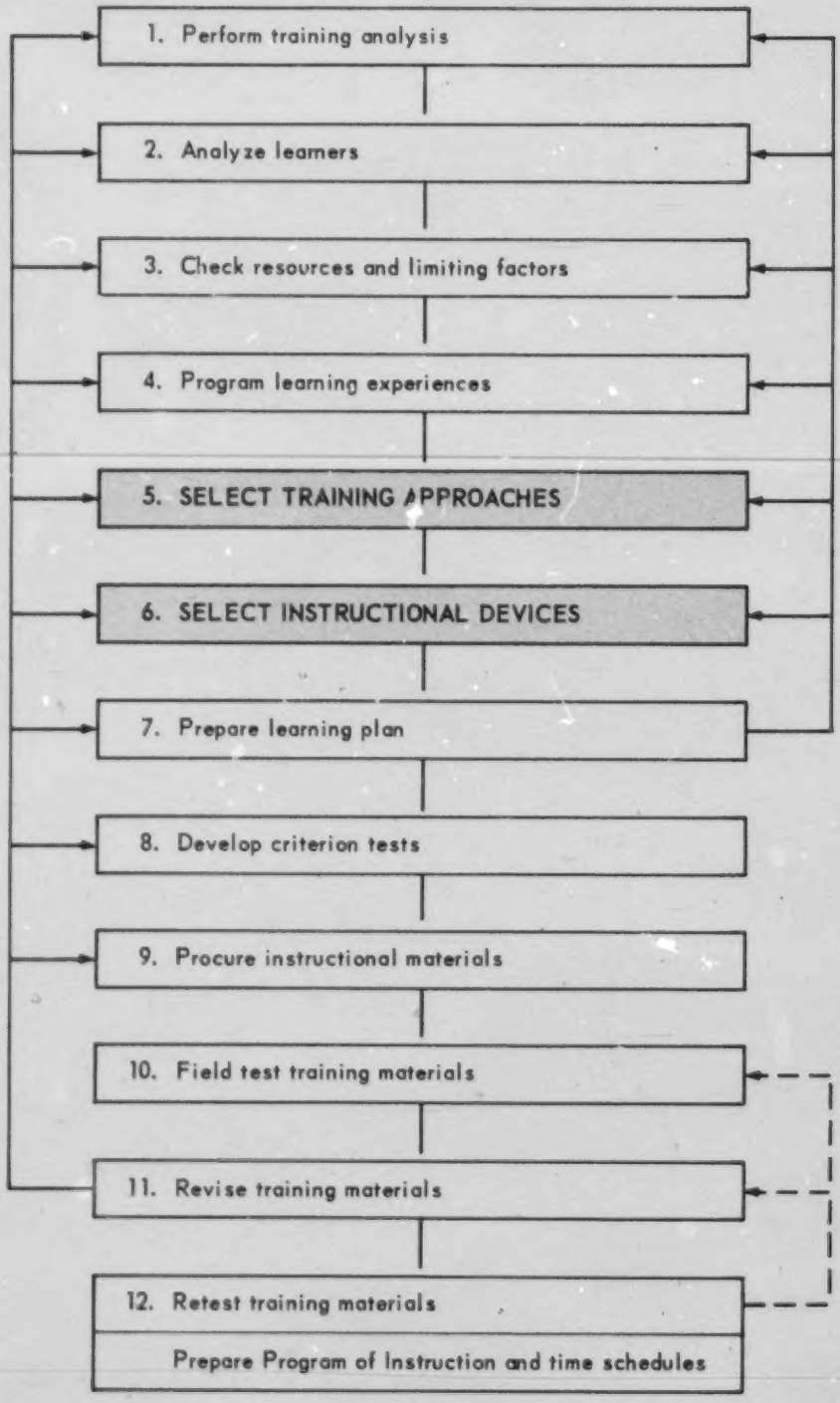
1. Perform training analysis
2. Analyze learners
3. Check resources and limiting factors
4. Program learning experiences
5. SELECT TRAINING APPROACHES
6. SELECT INSTRUCTIONAL DEVICES
7. Prepare learning plan
8. Develop criterion tests
9. Procure instructional materials
10. Field test training materials
11. Revise training materials
12. Retest training materials
Prepare Program of Instruction and time schedules

Figure 1

(muscular performance) would be taught differently than a leadership skill (management performance). *This manual suggests model approaches for the different types of learner performances.*

(6) Determine how the selected approach may be efficiently implemented, using appropriate instructional devices. The success of the approach to achieving the desired learner performances will depend, in part, on the effectiveness of the instructional devices that are chosen. *This manual provides guidelines for selecting instructional devices.*

(7) Prepare a plan of learning (refer to CONARC Regulation 350-100-1, Appendix D, Section III). Identify lessons, plan lessons, and apply the appropriate training resources using a learner performance approach. Note that, in this step, reference will be made to all previous steps; decisions made in these earlier steps will be modified, as needed, to improve the materials being developed.

(8) Develop criterion tests. Determine whether the test results represent the desired quality of job performance. At various points in the training program the performance of the learner should be assessed to (a) determine the feasibility of continuing his training, (b) provide additional (remedial) preparation, or (c) provide information for the commander or the training manager, indicating the adequacy of the learning program. The test should be designed to fulfill its primary function; that is, either (a), (b), or (c) above.

(9) Procure instructional materials through appropriate channels.

(10) Field test the training materials. Prior to full-scale use, the instructional devices and materials should be pretested; since even the best judgment can not replace actual testing.

(11) Revise and refine the training materials. On the basis of the pretest results, determine where the instructional materials, sequences, and instructional devices require changes, and make the appropriate revisions. Note that in this step, review and possible modification of the first seven steps and Step 9 may occur.

(12) Retest the training materials and revise as needed. If major modifications are needed, Steps 10 and 11 should be repeated. (To maintain continually effective training materials, review and revision should be scheduled on a regular basis after a program is in use.) Finally, prepare the POI and time schedules, following CONARC

Regulation 350-1 (Annex Q), CONARC Regulation 350-16, and other appropriate regulatory guidance.

This 12-step procedure shows the overall context of the process of developing training materials. The various steps of the procedure interact with one another, often in such a way that decisions at a later step may require review and revision of tentative decisions at earlier steps. This manual only provides assistance in accomplishing Steps 5 and 6.

The need to pretest training materials must be emphasized. Research has shown that pretesting and revising training materials results in a better product, to the later benefit of the learner. The judgment of even an experienced instructor is not as efficient as actual testing. Testing by the person developing the training materials should be included as part of the design of the program.

Chapter 2

GENERAL LEARNER MODEL

A general learner model designed to help the training developer construct a specific training program, is presented in this chapter. Training is understood as the process by which individuals learn the knowledges, skills, and attitudes which will fit them for adequate job performance. The principle which underlies this model is that learning is done by the learner; teaching does not guarantee learning. The emphasis in the general learner model will be on the input information and on the conditions that promote learning.

The model (Figure 2) includes and interrelates the factors reported to be involved in learning. In general, it suggests that the success of a training program depends on providing the learner with conditions under which he may learn, not just on how well material may be presented.

Insert Figure 2

Information *inputs* in the model are summarized as goal awareness information, task-related information, and feedback. The learner must know what is expected of him, he must be given the information needed to provide the appropriate performance, and he must be given the opportunity to evaluate his performance or have it evaluated. *Throughput* consists of the appropriate mental operations that are related to performance. The *outputs*, expressed as learner performance, are typified as recall of facts, recall of procedures, acquisition of discrete motor skills, acquisition of reactive skills, use of concepts, reactive decision making, and putting attitudes into practice. Since the focus of the entire training process is learner performance, the following description of the model will begin with discussion of the output.

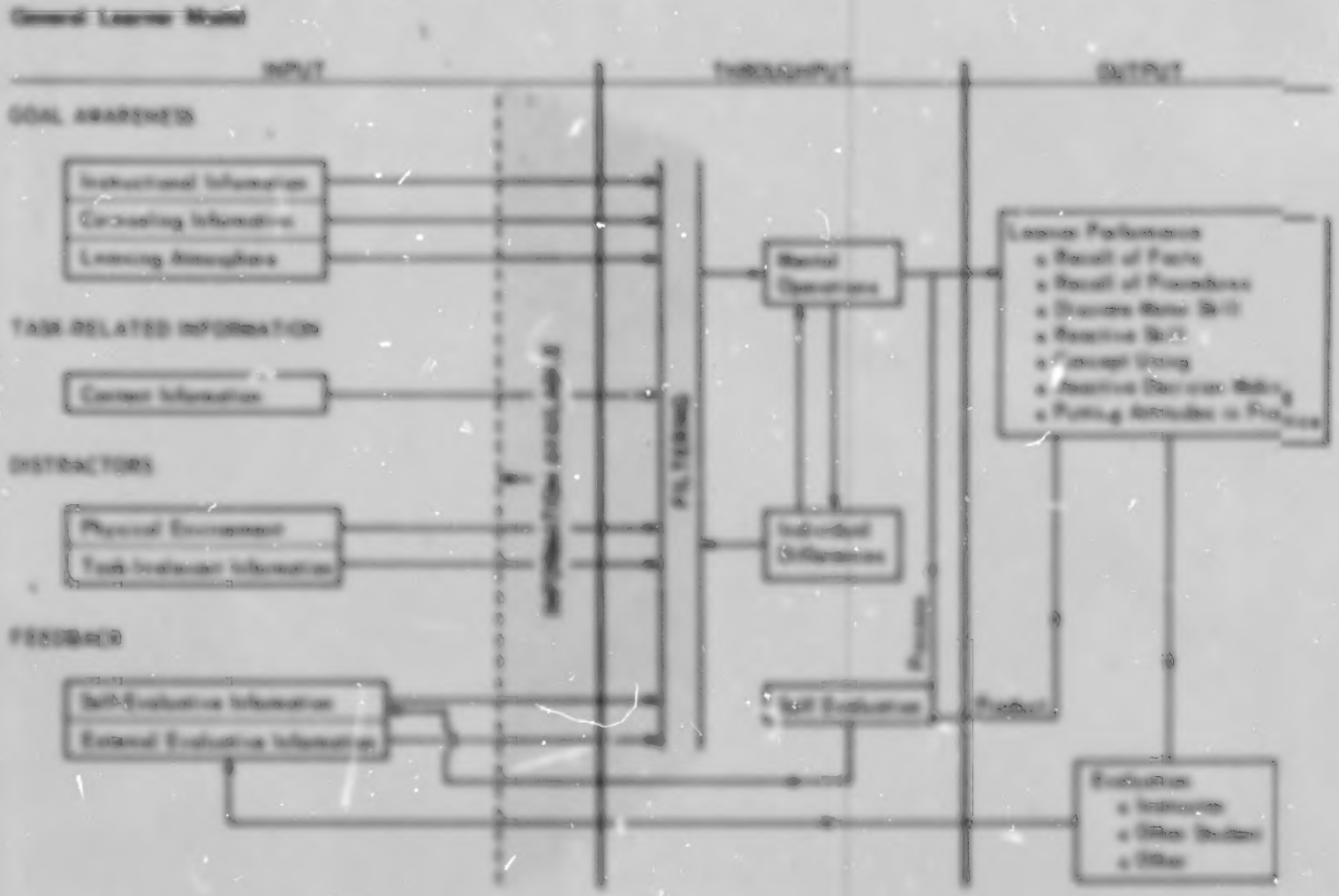
General Learner Model
INPUT
THROUGHPUT
OUTPUT
GOAL AWARENESS
Instructional Information
Cueing Information
Learning Atmosphere
TASK-RELATED INFORMATION
Content Information
DISTRACTORS
Physical Environment
Task-Irrelevant Information
FEEDBACK
Self-Evaluative Information
External Evaluative Information
Mental Operations
Individual Differences
Self Evaluation
Learner Performance
Evaluation

Figure 2

[illegible]

[illegible]

[illegible]

reasons: (a) Long-term recall of pictures and objects is aided when the learner repeats their labels, and (b) providing names or descriptions of pictures and objects increases the probability that the learner is seeing and interpreting them as desired. *Words direct attention to pictures and objects, and are a help in categorizing them.*

(4) *Where it is desirable in instruction to substitute a photograph or drawing for an actual object, it is important to know how to represent that reality adequately for the learner.*

(5) *Sight is a superb channel for representing spatial distinctions, but relatively poor for showing temporal distinctions.*

(6) *Hearing is superb for representing temporal distinctions, but relatively poor for spatial distinctions.* Supportive evidence is provided by the fact that auditory tracking is much less accurate than visual tracking.

(7) *In general, the sensory channel used in the final testing or application situation—that is, in the desired performance—should be employed during instruction and practice.*

(8) *For words using a single sensory channel in a learning situation, the written message appears to have greater information-carrying capacity than the spoken message; the more difficult or complex the level of the message, the greater the advantage of the written over the spoken.*

(9) *However, there is considerable evidence that objects and pictures of objects (line drawings) are better remembered than names of objects, other things being equal.* These results have been found for a wide variety of learning conditions. Combinations of words and pictures may be extremely useful. In general, the most effective combination of pictures and words or numbers is a pictorial stimulus and a word or number response label or description.

Type of Information and Instructional Device

Certain types of information pertain to specific kinds of performance. The specification of the type of information required is based upon the congruence of the information input with the specifiable performance. Type of input and sensory channel should be selected on the basis of the performance required. The principle that the input information should match the performance output pertains most directly to the goal-awareness category of information.

The training objective will often suggest the most useful types of information. Some examples would be: (a) aircraft identification would usually require written or heard symbols associated with pictured signs; (b) the golfer modifying his swing would require either heard symbols or dynamic-pictured signs (or both); (c) the interpretation of ground surveillance radar would require heard signs, and possibly heard symbols; (d) the person taking a written test would generally perform better when he had been provided similar written study materials.

No single instructional device provides such inherent superiority as to be most suitable for all learning experiences. When a particular series of performance requirements has been programmed, the most effective means (i.e., instructional devices) for presenting the necessary information input should be selected. However, since knowledge of the learning process is far from complete, a great deal of the effectiveness of any instructional program will depend on its operational testing, revision, and retesting. Comparisons of results using different instructional devices would be a useful step in designing an effective instructional program.

The term, instructional devices, refers to information-mediating equipment, methods, and materials. This definition is flexible enough to include the lecturer and the book and such equipment as the 16mm sound projector. When characteristics of the "software" (the page, the film, the lecture script) can be varied in such significant areas as sound or color, this fact is noted in describing the characteristics of the particular instructional device. Since information is what instructional devices provide, some previously stated distinctions are reemphasized: (a) The sensory channel through which the learner receives information may be seeing, hearing, or "feeling"; (b) the information itself may be arbitrary in form and bear no similarity to that which it represents (such as words or numbers), or it may resemble in certain ways that which it represents (such as pictures).

Before choosing the instructional device, one must clearly specify the performance required of the learner. No instructional device in itself directly assures mastering of performance, although use of the most appropriate device(s) often may lead to greatly improved performance. Essentially, an instructional device provides the vehicle for the learner to receive the information required to produce the performance. Instructional devices actually do little more than deliver information through the selected sensory channel.

In this analysis, six groupings of instructional devices are treated as representative:

(1) Live Human (e.g., lecturer, tutor).

(2) Recorded Motion or Sound (e.g., tape recorder, 16mm film with sound and color).

(3) Graphic (e.g., overhead projector, book with color plates).

(4) Simulator or Actual Equipment.

(5) Computer-assisted Instruction or Programed Instruction.

(6) Small Group (e.g., role playing, discussion group).

Table 1 represents the results of examining the characteristics of instructional devices and charts their capability to present a specific type of information through a given sensory channel.

Insert Table 1

Table 1

Information Type and Instructional Devices

Instructional Device	Symbols					Signs					
	Written	Color	Gestural	Heard	Tactual (Experience)	Pictured	Dynamic Pictured	Color	Gestural	Heard	Tactual (Experience)
1. Live Human											
Lecturer	No	No	Yes	Yes	No	Limited	Limited	Limited	Yes	Limited	No
Demonstrator	No	No	Yes	Yes	No	Limited	Limited	Limited	Yes	Limited	No
Tutor or Coach	No	No	Yes	Yes	No	Limited	Limited	Limited	Yes	Limited	No
2. Recorded Motion or Sound											
Tape Recorder	No	No	No	Yes	No	No	No	No	No	Yes	No
Film Cassette (super 8, silent, color)	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
Film (16mm, sound, color)	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
TV (B/W)	Yes	Limited	Yes	Yes	No	Yes	Yes	Limited	Yes	Yes	No
TV (B/W, record and playback function)	Yes	Limited	Yes	Yes	No	Yes	Yes	Limited	Yes	Yes	No
3. Graphic											
Overhead Projector	Yes	Yes	Limited	No	No	Yes	Limited	Yes	Limited	No	No
Film Strip (silent, color)	Yes	Yes	Limited	No	No	Yes	Limited	Yes	Limited	No	No
Film Slides (35mm, color)	Yes	Yes	Limited	No	No	Yes	Limited	Yes	Limited	No	No
Blackboard	Yes	Limited	Limited	No	No	Yes	Limited	Limited	Limited	No	No
Book (color plates)	Yes	Yes	Limited	No	No	Yes	Limited	Yes	Limited	No	No
Printed Handouts	Yes	Limited	Limited	No	No	Yes	Limited	Limited	Limited	No	No
4. Simulator or Actual Equipment											
Simulator	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible
Actual Equipment	Possible	Possible	No	Possible	Possible	Possible	Possible	Possible	No	Possible	Possible
5. CAI or PI											
Computer (words and numbers)	Yes	No	No	No	No	No	No	No	No	No	No
PI (including pictures)	Yes	Limited	No	No	No	Yes	Limited	No	Limited	No	No
6. Small Group											
Role Playing	No	No	Yes	Yes	No	Limited	Limited	Limited	Yes	Limited	No
Discussion Group	No	No	Yes	Yes	No	Limited	Limited	Limited	Yes	Limited	No

Chapter 4

INFORMATION AVAILABILITY: EXPOSURE

This chapter focuses on the fundamental exposure aspects of presenting information to the learner. All performances, as shown in the general learner model, depend on the availability of appropriate information. In general, perceptual principles are fundamental to further mental operations (whose outcome is a desired learner performance) because they influence what information is available to the learner. Some of the principles and research studies applicable to receiving available information are summarized in this chapter.

Principles

One of the most important facets in teaching is to insure that the appropriate cue (the information necessary to learn a performance) is effectively available to the learner. Fundamental to all other work is the simple fact that a learner who is not exposed to information can not use it; also, unless the information is apparent to him, he may not select it.

Attention

The attention the learner gives to the available information is an important element in the learning process. Generally, a person's attention is drawn to what is novel, to whatever stands in contrast to immediate past experience or to life-long experience. For example, wind is noticeable on a quiet day, a lull on a windy day; record snowfalls and heat waves attract attention, normal weather does not.

Further, one's attention is drawn and held by complexity. Given a choice, people have been shown to spend more time looking at

(1) Figures having more numerous elements rather than fewer.

(2) Displays having an irregular arrangement of elements.

(3) Elements in a group that are different in structure rather than humorous issues.

A learner often will pay little attention to material that is too simple for him to restudy, learn, or treatment. When pacing is done enough for slower learners, faster learners often become bored and inattentive.

When designing learning programs it is wise to build three basic principles:

(1) *Attention (and sustained learning) can be developed through a controlled arousal of moderate anxiety.* Telling students that a test is to follow a phase of learning is one example of this arousal.

(2) *Attention comes from success in learning, while persistent failure will extinguish motivation to learn.* Unpleasant experiences related to specific learning activities reduce interest. Pain, fear, frustration, humiliation, embarrassment, boredom, and physical discomfort also will reduce or extinguish learning motivation, although some short-term learning activities may occur.

(3) *Attention is a learned response.* Students must be rewarded for attention behavior.

Selective Perception

(1) *Each person does not see or hear the same information*—a phenomenon called selective perception or set (i.e., readiness to attend to a particular thing). In general, the better a learner sees or hears an object or person, event or relationship, the better he can remember it. Further, a learner can see and hear information better and learn it better if it is consistent with his own values than if it is inconsistent.

Several other principles should be considered in designing a learning program:

(2) *People influence people;* a person's attitudes are influenced by his instructors and peers. Activity and productivity depend upon the characteristics of the instructional leadership provided. However, there is no clear superiority of one kind of instructional leadership over another for all purposes (although enthusiastic instructors are preferred over unenthusiastic ones).

(3) Understanding of the overall objectives, nature, and purpose of a task will usually help an individual's motivation to learn.

(4) The purpose or goals of the learner determine the focus of his attention. The learning experience must appear to him to be related to his own long or short term goals. The learner will "filter out" what he may assume is irrelevant information. Information is not simply transferred intact from the environment or from other humans to the learner. It is always subject to the learner's filtering processes.

Exposure to Material

At the most fundamental level, simple physical exposure to the information is necessary to provide an opportunity to learn it. In some living learning programs, up to one-sixth of a trainee's scheduled training hours are given to audiovisual/classroom/housekeeping activities, often leaving the individual trainee with no way of learning the information they missed. If the information input of any class period is considered to be unimportant, it should be discounted; when the input is critical, measures should be taken to insure that the trainee is given the opportunity to receive it. For example, tape recordings of missed lecture material might be provided (some studies have shown that learning lecture material is equally effective live and tape recorded).

Learner Involvement

The learner's involvement in the learning process also affects the receiving of available information.

(1) Active participation in learning and active acquisition by the learner are often superior to seemingly passive reception of information.

(2) Human beings tend to be more productive when they work in groups rather than in isolation, even when no interaction is apparent between the members of a group.

(3) Within a training context, however, the individual will perform more effectively when motivated as an individual rather than as a part of a group. Motivation increases when there is personal involvement. The individual may be motivated to work toward when he is apprehended (i.e., personally identified with the results of the task).

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

they may be useful in particular tasks. In one study of verbal learning, vanishing cues helped the learner in delayed recall, but not in immediate learning.

Using a programmed instruction format, several studies have involved comparisons of multiple choice answers with constructed answers (i.e., written). Constructed answers have been shown to be superior for learning complex technical terminology, and for criterion tests that use program frames. The constructed answers typically require more learning time. When terminology not previously asked for in constructed responses (such as synonyms) is used in the criterion tests, the multiple choice format has been shown to be superior for large segments of reading material.

The importance of presenting subject matter in a logical sequence has been emphasized by many theoreticians, but, as yet, experimental results have not justified this emphasis. The best guidelines, at present, are suggested by the functional context method of organizing instruction—a sequence which provides a job-oriented atmosphere. The order of presentation goes from "whole" to "part" (as the learner focuses upon the component parts), from concrete to abstract, and from operational to theoretical.

Several studies have involved examining various kinds of interaction between prompting (providing additional information designed to elicit the correct performance) and feedback (providing confirmation or knowledge of results). For simple learning tasks, prompting is generally more efficient for initially exhibiting the desired behavior. Other studies in which prompting and feedback were mixed have achieved best results from a 75% prompting - 25% feedback combination. Some experiments suggest that feedback is superior to prompting for delayed recall and transfer tasks.

Retention of written material has been made more effective by placing questions in the printed text, and providing the answers. Questions appeared to be most effective when placed after passages of moderate length.

Learning and retention have also been helped by the use of introductory material at a high level of abstraction, generality, and inclusiveness. This organizing technique, used before the main material is presented, is assumed to provide the learner with a conceptual framework within which the specific details can be fitted appropriately.

Instructional Device Characteristics

While an instructional device may be eliminated from consideration because it cannot present the desired instructional information type, there are numerous other factors to be considered in choosing among devices that do meet this criterion. Some of these factors are recorded in Table 3 and discussed in the following paragraphs.

Insert Table 3

Motion provides many useful cues, information that may be helpful in attaining a great variety of behavioral goals. Television and motion film generally provide these motion cues most effectively. Also, the overhead projector, with a polarizing wheel, is useful for simulating some types of motion. Motion film is generally most effective for speeding up or slowing down the perception of various phenomena. Simulators often are used to provide a variety of experiences in a short time.

These devices also provide effective magnification and reduction. The need for magnification and reduction lies in emphasizing critical cues.

Either a fixed or a variable sequence for the presentation of material to the learner is usually determined by the software material used. A lecturer is able to vary his sequence but many film devices (except for separate slides) do not provide this flexibility. Simulators and computers can be designed for use with either a fixed or a variable sequence. Emphasis can be shifted by changing a sequence.

Most film devices make it possible to manipulate illustrations. Normally, overlays and disclosures are suited for an overhead projector. Motion films are particularly suited for implosions, superimposures, animation, zoon, and camera angle effects. These techniques have all been shown to improve learner performances under certain conditions.

Cue summation, simultaneously providing two or more types of information, appears to be a powerful (and efficient) strategy in presenting information. While complete duplication of information through two channels (simultaneous written and spoken word) has not been shown to be effective (for good readers), other information types may be combined to improve learning. In general, it is efficient to combine pictures with words that emphasize, point out, interpret, or label significant information. Instructional devices that give information through two channels at once provide opportunities for cue summation, which is generally most effective when the picture is used with the spoken

Table 3

Display Characteristics and Instructional Devices

Instructional Device	Display Represents Motion	Display Speeds Up or Slows Down	Display Magnifies or Reduces	Display Has Fixed or Variable Sequence	Display Manipulations Possible	Level of Display Fidelity	Display Provides Cue Summation	Feedback Possible	Ease of Student Operation of Device	Three-Dimensional Display	Group Size Appropriate	Special Environs Required
1. Live Human												
Lecturer	Low	Low	N/A	V	No	N/A	No	Typically Vicarious	N/A	N/A	Small/Medium/ Large	No
Demonstrator	Low	Low	N/A	Task Specific	No	N/A	Yes	N/A	N/A	N/A	Small/Medium	No
Tutor or Coach	Low	Low	N/A	V	No	N/A	No	Yes	N/A	N/A	Individual	No
2. Recorded Motion or Sound												
Tape Recorder	N/A	Low	N/A	F	No	Varies	No	Not Typical	Medium	N/A	Small/Medium	No
Film Cassette (super 8, silent, color)	High	High	High	F	Yes	Medium	No	Not Typical	High	N/A	Small/Medium	Dark
Film (16mm, sound, color)	High	High	High	F	Yes	High	Yes	Typically Vicarious	Low	N/A	Small/Medium/ Large	Dark
TV (B/W)	High	High	High	F	Yes	Medium	Yes	Typically Vicarious	Low	N/A	Small/Medium/ Large	Screen Access
TV (B/W, record and playback function)	High	Low	Low	F	N/A	Medium	Yes	Yes	Low	N/A	Individual	No
3. Graphic												
Overhead Projector	Medium	Low	High	V	Yes	High	No	Not Typical	N/A	N/A	Small/Medium/ Large	No
Film Strip (silent, color)	Low	N/A	High	F	Yes	High	No	Not Typical	Medium	N/A	Small/Medium/ Large	Dark
Film Slides (35mm, color)	Low	N/A	High	V	Yes	High	No	Not Typical	High	N/A	Small/Medium/ Large	Dark
Blackboard	Low	N/A	Medium	V	Low	Medium	No	Not Typical	N/A	N/A	Small/Medium	No
Book (color plates)	Low	N/A	High	F	Low	High	No	Limited	High	N/A	Individual	No
Printed Handouts	Low	N/A	Medium	F	Low	Low	No	Limited	High	N/A	Individual	No
4. Simulator or Actual Equipment												
Simulator	Varies	Varies/Low	Varies/Low	V/F	Varies	Varies	Possible	Yes	High	Varies	Small	As Specified
Actual Equipment	Varies	Varies/Low	Varies/Low	V/F	Varies	Identity N/A	Possible	Varies	High	Yes	Individual/ Small	As Specified
5. CAI or PI												
Computer (words and numbers)	N/A	N/A	N/A	V/F	No	Low	No	Yes	High	N/A	Individual	Individual Console
PI (including pictures)	Low	N/A	Medium	V/F	Low	High	No	Yes	High	N/A	Individual	No
6. Small Group												
Role Playing	Low	Low	N/A	V	No	N/A	Limited	Limited	N/A	Limited	Small	No
Discussion Group	Low	Low	N/A	V	No	N/A	Limited	Limited	N/A	Limited	Small	No

word (TV and 16mm sound motion picture are two instances). However, many other combinations are possible (e.g., an overhead projector with a lecture, or the filmstrip with a tape recorder).

Fidelity of sight or sound indicates the faithfulness of a reproduction to the original. Film reproduction is superior to available electronic reproduction. However, when a crude pencil sketch story board of a film was compared with a finished color version, no reliable difference in performance resulted. Fidelity may not be a critical factor, although it has been studied extensively in connection with simulators. As long as the essential information or cues are presented, adequate performance (and transfer) is generally possible. Realism appears to have no inherent superiority in providing adequate transfer to job performance. Testing is usually necessary to determine whether training is transferred to performance.

Ease of operation refers to the complexity of using an instructional device by learners. While training practice does not usually provide individualized instruction and thus require student operation, such Army-initiated concepts as the single topic film loop (now mostly on 8mm) are particularly suited to individual learning. Holograms, mock-ups, and some simulators provide 3-D cues. Well-designed film usually gives adequate information for learning most 3-D tasks.

Group size and special conditions are included in the tabulation of characteristics so that the adequacy of facilities for the particular instructional device may be evaluated. In over 200 studies of lectures, no differences have been shown that could be attributed to group size, but one fairly carefully controlled study showed that a small group performed better than a large group (both groups received essentially the same lecture, no questions and no discussion). The significant difference between the groups was attributed to the fact that the smaller group paid closer attention. A TV study in which individuals at home learned better than a classroom group may also be related to this attentiveness factor.

Chapter 6

RECALL OF FACTS

In the remaining chapters of this manual, the factors involved in selecting various types of instructional devices will be discussed in relation to the various groups of learner performances that make up the output portion of the learner model.

The purposes of this chapter are to examine principles related to the recall of facts, to suggest an approach to learning facts, and to relate the use of instructional devices to this approach.

The recall of facts is a learning task suggested by such behavioral objectives as to recall, to recognize, to read (aloud), to identify, to state, to listen, to label, or to discriminate. These are learner performances that imply the formation of an association or set of associations. Receiving adequate information is assumed as a requisite.

Principles Applicable to Recall of Facts

A review of the literature suggests the following five principles:

(1) The task must be defined for the learner in such a way that the appropriate performance may occur.

(2) Frequent repetition (this includes the concept of practice) aids retention.

(3) Organized material is learned more readily than disorganized material. When material does not possess an internal structure, the learner must impose one. One function of frequent repetition is to allow the learner an opportunity to develop a structure if one is needed.

(4) Prompt correction is necessary to prevent fixation of errors by the learner.

(5) Repetition (practice) should be carried on under arrangements in which correct responses are rewarded. It has generally been found that rewards and successes are more effective than punishments or failures in promoting learning.

An Approach to Recall of Facts

A large part of Army training time is invested in meeting behavioral objectives that can be typified as the recall of facts. Typical of such objectives are the learning of nomenclature and the learning of codes or symbols.

Training in the recall of facts may also include facets of what may be called concept acquisition and rule-and-principle learning, where the learning progress primarily requiring these higher-order mental operations to this simpler level. The distinction between training in the recall of facts and the acquisition of concepts is based upon the selected approach rather than any inherent inherent characteristic of the material.

When job performance requires the same output from all performers after they are provided with the relevant cues or information, the recall-of-facts approach may be used in training. Note, however, that when some higher-order mental operations are taught at this level (as facts), there may be two negative consequences. First, retention is reduced, and therefore more over-learning may be required to ensure adequate performance. Second, transfer to new job performances may be reduced since the learner is not able to deviate greatly from the job conditions for which he was specifically trained.

There phases are important in fact learning: a meaningful context, an opportunity for practice, and feedback as to the correctness of the answer. These phases may be expressed as conditions:

(1) Instructions that evoke the desired answer (identification, label, name) must be provided.

(2) The learner must be given an opportunity to respond.

(3) Immediate feedback as to whether his answer is right or wrong must be supplied.

A useful approach to implementing these conditions would include:

(1) Provide as meaningful a context as possible. Make explicit connections between a new fact and previously learned facts.

(2) If discrimination between items is involved, emphasize the differences between them.

(3) Make use of frequent repetition (practice). Plan for as much overlearning as is needed to ensure adequate performance of the particular job.

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Chapter 8

ACQUISITION OF DISCRETE MOTOR SKILLS

The purposes of this chapter are to list the principles related to acquiring discrete motor skills, to suggest an approach to acquiring such skills, and to relate the use of instructional devices to this approach.

Acquisition of discrete motor skills is primarily related to gaining an acceptable level of proficiency in performing a complex physical act. Typical verbs describing behavioral outcomes of acquiring discrete motor skills are to hit (a target), to hit (a ball), to hammer (a nail), or to throw (a strike).

Principles Applicable to Discrete Motor Skills

Principles related to the acquisition of discrete motor skills are:

(1) The learner must be made aware of the behavior that he is expected to be able to perform.

(2) A learner's resolve to learn results in improved performance.

(3) Overt action is necessary for acquisition of physical skills. Mental practice also is helpful at some stages.

(4) Over-learning leads to better retention.

(5) Knowledge of results (feedback) is one of the most important variables governing skill acquisition. Improvement must be recognizable to the learner by qualitative or quantitative cues not usually provided at lower levels or early learning stages of performance.

(6) Feedback should be immediate or very nearly so.

(7) A limited amount of reflective discussion and explanation may direct the learner's attention to essential features of the skill, but this discussion must not be too detailed and must immediately be related to his efforts.

(8) Study of a model performance to observe relationships between actions and their results may help, although such insights may be difficult to acquire. It is usually helpful for a learner to make a mental review of essential elements of the performance.

(9) Normal progress enables the learner to change from an initial dependence on external cues to reliance on internal cues.

(10) Aptitudes involved in learning a skill may differ at different stages of mastering the skill.

An Approach to Acquiring Discrete Motor Skills

Discrete motor skills must be developed for tasks which require practice to perform some physical activity. Most individual athletic feats may be classed as discrete motor skills.

The essential factors in acquiring such skills are goal awareness, practice, and feedback. The relevant conditions are:

(1) Availability of an adequate conceptual model of the expected behavior.

(2) Opportunities to practice the response.

(3) Feedback as to relative adequacy of performance.

(4) Suggestions as to modifications that will improve performance.

The recommended approach for acquiring discrete motor skills includes:

(1) Give the learner an awareness of what constitutes the desired goal behavior by presenting a model, or by rewarding him for progressively better approximations of the task (shaping). Unfamiliar behavior can be acquired through imitation of models, through cuing, and through shaping.

(2) Provide the learner with opportunity to practice at an early stage of learning, and continue to provide it.

(3) Give (or let his performance give) immediate or nearly immediate feedback. This should, at first, be a rough guide to performance.

(4) Supply, through a model or through coaching, successively finer discriminations between learner actions and the desired responses. Thoughtful practice is most efficient.

Under fire, a man's life can depend on how well he has learned a new skill in movements

Facilitating the Approach

Normally, an adequate model is a very good way of inducing goal awareness. The model may be live, on film, or on video tape. For most discrete motor skills it should include the clearly shown motions involved in the particular skill. In one instance, showing the skills in slow motion was shown to improve learning. Cuing or shaping may be necessary to provide goal awareness; this would usually require a simulator, but individual coaching also may be used very effectively.

Skill-related information is usually provided to prevent the development of patterns which, in themselves, limit the final level of achievement, although the pattern may provide short-term appearances of improvement. However, it is noteworthy that some ways of learning the skill should be encouraged even if they deviate from the model. Only patterns of action that have been shown as harmful to acquiring the desired level of skill performance should be discouraged.

Feedback, most readily derived from practice, is of critical importance. Individual coaching requirements may be reduced by using film loops or TV playbacks at advanced stages in learning a discrete motor skill. Use of these techniques early in the learning process without expert assistance may slow acquisition of the skill. Mental practice has been shown to be helpful and probably indicates the need for thought and care during practice. Participation must not interfere with receiving the basic information; thus a slow rate of development is generally recommended.

An overview of the use of instructional devices in acquiring discrete motor skills appears in Table 6.

Insert Table 6

Table 6

Instructional Device Capability and Acquisition of Discrete Motor Skills

Instructional Device	Goal Awareness Information	Knowledge of Information	Practice	Feedback
1. Live Human				
Lecturer	Limited	Yes	N/A	N/A
Demonstrator	Yes	Yes	N/A	N/A
Tutor or Coach	Yes	Yes	Yes	Yes
2. Recorded Motion or Sound				
Tape Recorder	Yes	Yes	N/A	N/A
Film Cassette (super 8, silent, color)	Yes	Yes	Yes	Vicarious
Film (16mm, sound, color)	Yes	Yes	Typically Vicarious	Typically Vicarious
TV (B/W)	Yes	Yes	Typically Vicarious	Typically Vicarious
TV (B/W, record and playback function)	N/A	N/A	Yes	Yes
3. Graphic	Limited	Yes	Not Typical	Not Typical
Overhead Projector				
Film Strip (silent, color)				
Film Slides (35mm, color)				
Blackboard				
Book (color plates)				
Printed Handouts				
4. Simulator or Actual Equipment	N/A	N/A	Yes	Yes
Simulator				
Actual Equipment				
5. CAI or PI	Limited	Yes	N/A	N/A
Computer (words and numbers)				
PI (including pictures)				
6. Small Group	N/A	N/A	N/A	N/A
Role Playing				
Discussion Group				

Chapter 9

ACQUISITION OF REACTIVE SKILLS

The purposes of this chapter are to list the principles related to acquiring reactive skills, to derive an approach to learning these skills, and to suggest ways in which instructional devices may be used to facilitate this approach. The term "reactive" is used to emphasize the fact that the appropriate response is defined by unpredictable, sequential environmental cues.

The acquisition of reactive skills involves attaining a proficiency level in performing a series of related reactive acts. Typical verbs describing behavioral outcomes of acquisition of reactive skills are to track (a target), to type (a letter), to fly (an airplane), to function adequately (as systems team performances).

Principles Applicable to Acquiring Reactive Skills

The principles listed as applicable to the acquisition of discrete motor skills are applicable to reactive skills. Briefly they are:

(1) The learner must develop an awareness of the expected behavior.

(2) A student's intention to learn results in improved performance.

(3) Overt action is necessary for acquiring physical skills (however, mental practice is helpful at some stages).

(4) Goal-learning improves retention.

(5) Feedback is one of the most important variables governing acquisition of skills.

(6) Feedback should be immediate or very nearly so.

(7) A limited amount of reflective discussion and explanation may direct the learner's attention to the essential features of the skill, but must not be too detailed and must immediately be related to the efforts.

(6) It usually helps the learner to study a model, to note interpersonal behaviors enticed and their results, although these insights may be difficult to acquire.

(7) Normal progress in learning a skill enables the learner to change from a dependence on external cues to internal cues.

(10) Aptitudes involved in learning a skill may differ at different stages of progress in mastering the skill.

Approach to Acquiring Response Skills

Two types of response skills are distinguishable, but the same principles apply to both types. "Adjustive response" skills consistently called teaching or adjusting) involve a varying, continuing signal display that demands specific calling responses for appropriate performances. "discrete response" skills involve selecting from a set of possible responses (as in typing a letter).

The primarily factors involved in acquiring response skills appear to be goal awareness, practice, and feedback. The related acquired conditions are:

(1) Availability to the learner of an adequate conceptual model of the expected behavior.

(2) An opportunity to practice behaviors in response (or within) task contexts.

(3) Feedback resulting from practice.

(4) Suggestions that will improve the performance.

The recommended approach would, therefore, be to:

(1) Give the learner an awareness of what constitutes the desired goal behavior by presenting a model, using, or creating. (Interactive behavior can be acquired through recitation of models, through using, and through shaping.

(2) Provide the learner with an opportunity to practice at an early stage of learning, and continue to provide it. Demand thoughtful practice; do not permit patterns detrimental to overall performance to stabilize.

(3) Lessen the acquisition of the discrete motor skills that may be components of the response skill. Focus attention on behaviors that are difficult to perform, minimizing the overall context whenever possible.

[illegible]

should deal with irrelevant characteristics of the informational display (this helps to stress the essential characteristics that the learner should abstract).

The learner can be aided in differentiating by showing together similar concepts, for instance, the concept of "tactics" and the concept of "strategy." Such comparison of related concepts makes differentiation more precise. The learner should also establish connections between related concepts, as they must be organized in his own understanding. When concepts are structurally related—for example, in a hierarchical structure where certain concepts can be learned only when other concepts are already known—learning is helped by using the implied structural sequence.

(2) Practice and feedback

This aspect of the approach involves the following:

(a) Present a new positive example of the concept and ask the learner to identify it.

(b) Verify the level of the learner's comprehension of the concept.

(c) Have the student verbally define the concept.

(d) Provide opportunities for student response and feedback to him.

The instructor analyzes the learner's mistakes and asks him to repeat the operation. The learner needs to state verbally what is essential and what is not. He should stress the essential features of the concept if he will be required to use it in performing his job.

The instructor has to identify the stage or level of meaning the learner has attained, then use this information as a basis for helping the learner find and take the next step forward. Guidance is the primary ingredient in the feedback the learner requires. The greatest benefit from feedback is derived when the learner is given time enough to integrate the new information before moving on to the next phase of learning. When the learner is just beginning to comprehend the dimensions of a concept, misleading feedback information confuses him and delays concept acquisition. A concept erroneously learned is difficult to relearn correctly.

Facilitating the Approach to Concept Acquisition

When a learner is made aware of what constitutes the objective of an instructional segment, through verbal descriptions and statements of minimum performance

requirements, he is enabled to evaluate, abstract, and relate what to him are the most important elements of the information presented. He reorganizes, in his own terms, the information presented to him. He then is able to direct his efforts more efficiently to achieving the appropriate performance, and has an adequate basis for noting his own progress and difficulties and seeking appropriate guidance. An instructor or tutor, PI booklet, or CAI program can effectively provide the required goal awareness.

Concepts are acquired through a variety of experiences; one study indicated six or seven as an optimal number of instances. The present approach suggests providing the learner with a wide variety of experiences in which the concept is appropriate (emphasizing the important features of the concept), and differentiating it from related concepts.

Multi-image displays often create an opportunity to compare and contrast visual information. Film and electronic instructional devices, such as the overhead projector, filmstrip, 8mm film loop, TV, CAI, 16mm sound film, and possibly some simulators can provide the recommended wide variety of experiences in a relatively short time.

Guided practice has been shown to be useful, but the need for learner responses and for feedback (in guidance or correction) of his responses would suggest a tutorial need (live, CAI, or PI). Programing of both the entry level (of personnel to be trained) and the output level of concept acquisition for performance of the job requires a training manager's careful attention. The training manager needs to program a series of vicarious experiences for the learner and give him guidance in his acquisition of essential concepts.

An overview of instructional devices in relation to concept acquisition factors appears in Table 8.

Insert Table 8

Four perceptual principles are related to concept acquisition:

(1) If a concept is basically spatial, like mountain, or mile, or cube, or anatomy, or leaf shape, then the eye is an effective sensory channel. Also, vision is appropriate when it is desirable to maintain a message in the learner's perceptual field for some time. Auditory sensations fade rapidly and must be presented again and again if the learner is to examine their interrelationships.

(2) If a concept is temporal, like rhythm, frequency, music or speech, the ear is an effective sensory channel.

Table 8

Instructional Device Capability and Acquisition of Concepts

Instructional Device	Goal Awareness Information	Related Information	Practice	Feedback
1. Live Human				
Lecturer	Yes	Yes	Typically Vicarious	Typically Vicarious
Demonstrator	Yes	Yes	N/A	N/A
Tutor or Coach	Yes	Yes	Yes	Yes
2. Recorded Motion or Sound	Yes	Yes	Typically Vicarious	Typically Vicarious
Tape Recorder				
Film Cassette (super 8, silent, color)				
Film (16mm, sound, color)				
TV (B/W)				
TV (B/W, record and playback function)				
3. Graphic	Yes	Yes	Possible	Possible
Overhead Projector				
Film Strip (silent, color)				
Film Slides (35mm, color)				
Blackboard				
Book (color plates)				
Printed Handouts				
4. Simulator or Actual Equipment	N/A	N/A	Yes	Yes
Simulator				
Actual Equipment				
5. CAI or PI	Yes	Yes	Yes	Yes
Computer (words and numbers)				
PI (including pictures)				
6. Small Group	Yes	Limited	Yes	Yes
Role Playing				
Discussion Group				

(3) If a concept involves both time and space, such as speed, or plant growth, or life cycles, or erosion, or city growth, or earth orbit, or the westward movement, then both eye and ear can be used as sensory channels. Words would be used in marking, describing, or calling attention to the visible changes.

(4) In general, the sensory channel used in testing the learner's achievement should be the one employed during instruction and practice.

Chapter 11

USE OF CONCEPTS: PROBLEM SOLVING

The purposes of this chapter are to recommend an approach to achieving complex concept-using learner performances as exemplified by problem solving, and to relate the use of instructional devices to the recommended approach.

In learner performances, concept acquisition represents a less complex level of concept using than problem solving. As previously stated, concept using involves gaining new information (or redefining previously available information), transforming or manipulating this information to make it fit a new task, and evaluating or checking to see whether the manipulation enables the performance of the task.

The principles and conditions for achieving concept-using performances are the same for both concept acquisition and problem solving; the distinction lies in the level of complexity of learner performance. The preceding chapter lists the principles and conditions for acquiring concept-using learner performances.

Approach to Problem Solving

Problem solving clarifies perplexing situations. The process involves restructuring the elements (or complexes of elements) of the problem, and applying previously learned rules or generalizations to generate a solution. To solve a problem, the elements (or complexes of elements) of the problem must be derived through analysis (differentiation) and synthesized (integration); that is, the right pieces must be selected and put together correctly.

Solving problems whose structure is familiar involves learner activity basically different from that used in solving problems whose structure is new to the learner. In solving problems of a familiar type, the learner comes to recognize common relationships

It often happens that a learner cannot solve a problem because he is unable to see [illegible] on the problem itself nor analyzing or finding the elements, facts, or rules that are appropriate.

To solve, the analytic-synthetic activity required of the learner for problem solving is complex. To solve simple problems, a learner needs, first, to divide the problem into parts; second, to subject these parts to special examination, consciously related to a possible answer concerning the given facts and some of the possible relations between them; and finally, to synthesize the parts into the answer as to finds the relations between the given information and the answer. To solve complete problems, the learner must divide the given information into a number of simple problems, then select the combination of the given information which will lead him to the overall solution (i.e., synthesis on the basis of tentative analysis).

Several techniques of problem solving strategies have been isolated:

(1) Concretization: The learner gives a problem posed in abstract form a concrete meaning and solves it with the aid of specific, familiar images.

(2) Abstraction: The learner avoids all specific details of the problem and expresses the problem content in more abstract concepts (such as mathematical symbols) which may clearly show the connections between the various elements.

(3) Diagram analysis: The learner uses to portray the relations between facts, concepts, or principles in conventional forms (rectangles, straight lines, circles, Venn diagrams) and then finds the necessary relations.

(4) Modification: The learner modifies the problem by excluding certain facts and when interpreting the impact of these changes, finds the way to solve the problem.

(5) Analogy: The learner creates a simpler, similar problem.

(6) Analytic Questions: The learner's attention is directed by analytic questions to analysis of the facts, concepts, or principles, and the connections between the various elements. These questions help the learner to isolate the important connections and major elements of the problem, and to concentrate attention on these elements and their connections.

[illegible] [illegible] [illegible] [

(5) Aptitudes involved in learning a task may differ at different stages of learning.

(6) Time spent in learning rules may increase the likelihood of the learner applying what he has learned to a new situation (more so than time spent in learning facts).

(7) The need to be able to generalize (synthesis) and to differentiate (analysis) suggests the importance of practice under varying conditions with corrective feedback.

(8) As information load on the person increases, perception narrows in scope. Increasing the information load first increases, then decreases, the effectiveness of communication in a complex network. There is an optimal level of information input for the individual making reactive decisions.

Approach to Reactive Decision Making

When the learner must make decisions, either in a changing environment or on the basis of the results of previous performed actions, the activity is termed reactive decision making. It includes such performances as troubleshooting and combat command decisions.

The factors that pertain to learning reactive decision making are goal awareness, availability of relevant information, practice, and feedback. The conditions related to these factors are:

(1) Awareness by the learner of the desired performance.

(2) Meaningfulness of the goal (and the learning) to the learner in terms of his own goals, interests, previous knowledge, or intended application.

(3) Availability of relevant information.

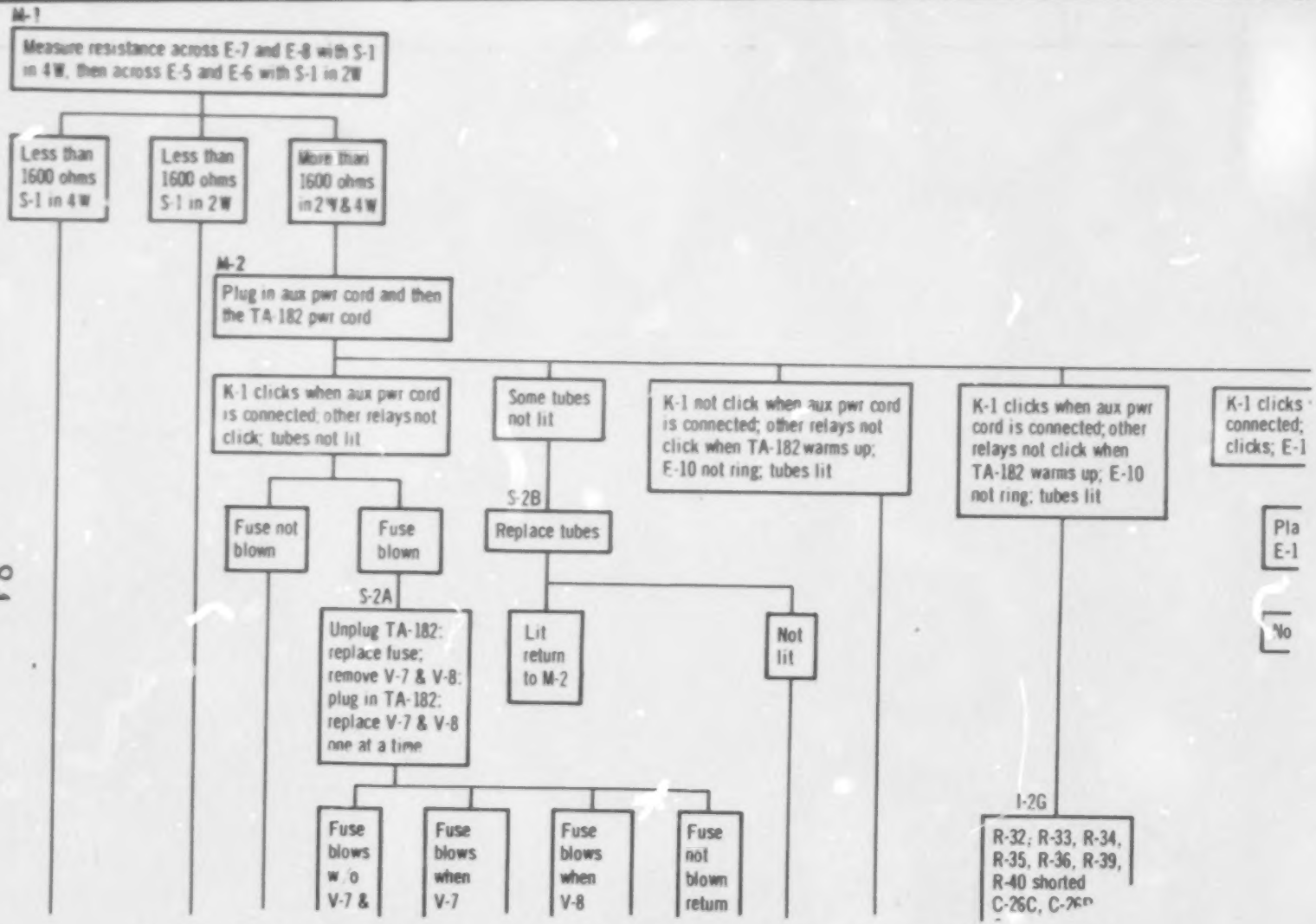
(4) Practice and feedback under varying conditions.

One approach would be to:

(1) Make the learner aware of the performance required and of the ways in which prior decisions are related to this performance.

(2) Have the learner recall the relevant concepts and principles.

(3) Provide practice and feedback used as guidance. Organized experience provides the framework for successful performance. After a performance the components of the reactive decision making process should be analyzed.


M-1
Measure resistance across E-7 and E-8 with S-1 in 4W, then across E-5 and E-6 with S-1 in 2W
Less than 1600 ohms S-1 in 4W
Less than 1600 ohms S-1 in 2W
More than 1600 ohms in 2W & 4W
M-2
Plug in aux pwr cord and then the TA-182 pwr cord
K-1 clicks when aux pwr cord is connected; other relays not click; tubes not lit
Some tubes not lit
K-1 not click when aux pwr cord is connected; other relays not click when TA-182 warms up; E-10 not ring; tubes lit
K-1 clicks when aux pwr cord is connected; other relays not click when TA-182 warms up; E-10 not ring; tubes lit
K-1 clicks connected; clicks; E-1
Pla E-1
No
Fuse not blown
Fuse blown
S-2B
Replace tubes
S-2A
Unplug TA-182; replace fuse; remove V-7 & V-8; plug in TA-182; replace V-7 & V-8 one at a time
Lit return to M-2
Not lit
I-2G
R-32; R-33, R-34, R-35, R-36, R-39, R-40 shorted C-26C, C-26D
Fuse blows w/o V-7 &
Fuse blows when V-7
Fuse blows when V-8
Fuse not blown return

Complex troubleshooting behaviors may be partly proceduralized and partly reactive decision making.

Note the similarities between reactive decision making and problem solving and refer to the previous discussion of problem solving.

Facilitating Reactive Decision Making

Goal awareness is critical for reactive decision making, as often the decisions may only be able to provide successive approximation to the desired goal. Clear understanding and awareness of the desired goal is essential. This awareness may be provided by verbal or pictorial descriptions and a statement of minimal performance requirements. A CAI program, PI booklet, instructor, or tutor may provide this goal awareness.

Since reactive decision making often consists in selecting relevant information from a much larger body of information, the learner needs to generate guidelines as to what kinds of information will be important. The learner develops efficient strategies through a wide variety of experiences in actually making decisions. Games and other forms of simulation can provide an environment for making practice in reactive decisions; organized experience provides the framework for subsequent successful performance. Analysis of the critical components of the reactive decision making process should follow a practice session.

Factors in problem solving which were discussed in Chapter 11 are also useful in examining the training of reactive decision making and should be reviewed. Preferred instructional devices are small group methods and simulation games which provide either vicarious or condensed experience. Feedback is critical in training for this behavior.

When the task can be reduced to the learning of procedures, the problem becomes that of selecting correct procedures. Simulation or coaching provides an appropriate feedback for this type of training. Simulation is also an excellent means of providing the learner with the numerous experiences necessary for decision making proficiency in a great variety of situations in a short time.

An overview on use of various instructional devices for training in reactive decision making appears in Table 10.

Table 10 here

Table 10

Instructional Device Capability and Interactive Decision Making

Instructional Device	Goal Awareness Information	Related Information	Practice	Feedback
1. Live Human				
Lecturer	Yes	Yes	Typically Vicarious	Typically Vicarious
Demonstrator	Yes	Yes	N/A	N/A
Tutor or Coach	Yes	Yes	Yes	Yes
2. Recorded Motion or Sound	Yes	Yes	Typically Vicarious	Typically Vicarious
Tape Recorder				
Film Cassette (super 8, silent, color)				
Film (16mm, sound, color)				
TV (B/W)				
TV (B/W, record and playback function)				
3. Graphic	Yes	Yes	Possible	Possible
Overhead Projector				
Film Strip (silent, color)				
Film Slides (35mm, color)				
Blackboard				
Book (color plates)				
Printed Handouts				
4. Simulator or Actual Equipment	N/A	Yes	Yes	Yes
Simulator				
Actual Equipment				
5. CAI or PI	Yes	Yes	Yes	Yes
Computer (words and numbers)				
PI (including pictures)				
6. Small Group	Limited	Limited	Yes	Yes
Role Playing				
Discussion Group				

Chapter 13

PUTTING ATTITUDES INTO PRACTICE

The purposes of this chapter are to list principles related to the development of attitudes, to suggest an approach toward putting attitudes into practice, and to relate appropriate instructional devices to this approach.

Putting attitudes into practice usually is not defined as a single performance, but rather as groups of related behaviors such as are exemplified by job safety (in maintenance personnel), sanitary practices (in food service personnel), and other behaviors such as reliability or responsibility. The content of this group of objectives is the set of behaviors from which we infer the holding of a specifiable attitude, which remains loosely specified because the particular behaviors are frequently too numerous for listing.

Principles Related to Attitude Change

Some principles related to attitude change are:

(1) The learner's attitudes affect what he perceives and applies selectively.

(2) Attitude change is promoted by inducing a behavioral commitment. Under some conditions, actively role-playing a previously unacceptable behavior increases its acceptability.

(3) Easy persuasion of a learner is generally related to a low self-esteem. Such a person may be equally easily persuaded to reaccept his original position.

(4) Group norms and peer attitudes exert a powerful effect on attitudes and behavior. A communicator's effectiveness is increased if he initially expresses some views that are also held by the audience.

(5) A learner's belief in the integrity or knowledgeability of the information source plays an important part in his attitude toward a message. The initial positive attitude, however, does not necessarily persist over time.

(6) A communication may evoke a "boomerang" effect on attitudes, strengthening the reverse of the attitude intended by the communicator. If the audience feels that a communication has a manipulative intent, their resistance is increased.

(7) Typically, attitudes result from the learner's cumulative experience, rather than from any single message.

(8) The greatest attitude change usually results when explicit conclusions are drawn from a message.

(9) Attitudes expressed as opinions may be changed by use of rewards. These changes, however, are primarily related to a rational component of attitude, and may not persist.

(10) Permanent changes in attitude require permanent changes in the individual. The person's reason for holding an attitude must often be changed before the attitude can be changed.

(11) Behavior patterns are often acquired by imitation.

(12) The more extreme the requested change in behavior, the greater the actual change that is likely to occur.

Approach for Putting Attitudes Into Practice

Attitudes are generally regarded as a disposition to act in certain consistent patterns which are learned rather than innate. An efficient way of changing many specific behaviors sometimes may be to change one or two underlying attitudes. The training developer must ask himself several questions, such as: How specific is the desired attitude change? How long must the attitude change last? Who or how many people are involved? What is the behavioral expression of the attitude change? Attitudes are difficult to modify, and ethical issues can readily be seen. The training developer is dealing with human beings whose integrity must be protected.

The conditions for putting attitudes into practice include:

(1) Availability of models showing the desired behaviors.

(2) An opportunity for the individual to make a behavioral commitment (such as a public statement of an attitude) to actions or opinions normally seen as an expression of the desirable attitude.

When used not only to learn health safeguards but to put them into practice

(3) Availability of positive (social) consequences related to the specific attitude.

(4) Rewarding and supporting the behaviors which indicate that the desired attitude is being put into practice.

The suggested approach for helping individuals put particular attitudes into practice includes:

(1) Providing appropriate prestige models of desired behaviors.

(2) Providing information pertaining to the desired behaviors, drawing explicit conclusions about the desirability of an opinion in action.

(3) Inducing a behavioral commitment by the learner to an opinion in action.

(4) Rewarding desired behaviors.

Helping You Attitudes into Practice

In trying to put particular attitudes into practice, goal statements may often be helpful or provide. The teaching environment must provide individual support for behaviors representing the positioned attitude. In some cases, providing such support is a necessary function rather than a learning function.

The difficulties are illustrated by one study in which inexperienced drivers exposed to driving safety films initially practiced the behaviors shown in the films, but their behaviors changed as they encountered inherent road practices that did not conform with practices shown in the films. Models of desired behavior can be provided by television, lectures, pictures, and the examples. If the attempt to modify attitudes is lectures, however, it may have the opposite effect.

To put one attitudes into practice the person must be changed, and should desire the change himself. Factual information supportive of the desired attitude should be available and "do" values should be the positive values most valuable of the actions positioned to the particular attitude. Examples appeals using files or TV viewer identifica- tion with the proponent of the attitude is facilitated may be helpful. Positive incentive experiences will help provide a responsiveness to change. However, the incentives should values with the proponent of an attitude will not prevent unless more individual need is met.

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